

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a semiconductor substrate having a plurality of connecting pads on one surface;

5 an insulating film formed on one surface of the semiconductor substrate, and having holes each corresponding to one of the connecting pads, an upper surface, and a recess having a bottom surface depressed from the upper surface in a direction of thickness; and

10 interconnections formed on the upper surface of the insulating film or on the bottom surface of the recess, and connected to the connecting pads through the holes in the insulating film.

2. A device according to claim 1, wherein each of
15 the interconnections is formed on the bottom surface of the recess in the insulating film.

3. A device according to claim 1, wherein each of the recesses in the insulating film has a pair of side surfaces, and spaces are defined between each
20 interconnection and the side surfaces of the recess.

4. A device according to claim 1, wherein the interconnections have connecting pad portions, and which further comprises bump electrodes formed on the connecting pad portions, and an encapsulating film
25 formed between the bump electrodes on the insulating film including the interconnections.

5. A device according to claim 4, further

comprising an upper insulating film formed between the insulating film and encapsulating film, and having holes formed in portions corresponding to the bump electrodes.

5 6. A device according to claim 5, wherein the insulating film and upper insulating film are made of materials containing the same main component.

 7. A device according to claim 5, wherein the upper insulating film and encapsulating film are made
10 of different materials.

 8. A device according to claim 4, wherein each of the bump electrodes protrudes from an upper surface of the encapsulating film.

 9. A device according to claim 4, wherein each of
15 the bump electrodes has a lower bump electrode and upper bump electrode formed thereon.

 10. A device according to claim 9, wherein the lower bump electrode protrudes from the upper surface of the encapsulating film.

20 11. A device according to claim 1, wherein the interconnections have connecting pad portions formed on the connecting pads, and which further comprises bump electrodes formed on the connecting pad portions, and an encapsulating film formed between the bump
25 electrodes on the insulating film.

 12. A device according to claim 1, wherein the insulating film is made of an organic resin.

13. A device according to claim 1, wherein the recess in the insulating film has a depth not less than a thickness of the interconnection.

14. A device according to claim 1, wherein the
5 insulating film has a thickness of 10 to 30 μm .

15. A device according to claim 1, wherein the recess has a depth of 5 to 15 μm .

16. A device according to claim 15, wherein the insulating film has a thickness of not less than 1 μm
10 from the bottom surface of the recess.

17. A device according to claim 1, wherein the interconnections are formed on the upper surface of the insulating film.

18. A device according to claim 17, wherein the
15 recess in the insulating film has a width substantially the same as intervals between the interconnections.

19. A device according to claim 17, wherein the interconnections have connecting pad portions, and which further comprises bump electrodes formed on the
20 connecting pad portions, and an encapsulating film formed between the bump electrodes on the insulating film including the interconnections.

20. A device according to claim 19, which further comprises an upper insulating film formed between the
25 insulating film and encapsulating film, and holes formed in portions corresponding to the bump electrodes.

21. A device according to claim 20, wherein the insulating film and upper insulating film are made of materials containing the same main component.

22. A device according to claim 20, wherein the
5 upper insulating film and encapsulating film are made of different materials.

23. A semiconductor device fabrication method comprising:

preparing a semiconductor substrate having a
10 plurality of connecting pads on one surface;
forming, on one surface of the semiconductor substrate, an insulating film having holes each corresponding to one of the connecting pads, an upper surface, and a recess having a bottom surface depressed
15 from the upper surface in a direction of thickness; and
forming, on the upper surface of the insulating film or on the bottom surface of the recess, interconnections connected to the connecting pads through the holes in the insulating film.

20 24. A method according to claim 23, wherein the interconnections are formed on the bottom surface of the recess.

25 25. A method according to claim 23, wherein the recess is formed to have a depth substantially equal to or larger than a thickness of the interconnection.

26. A method according to claim 23, further comprising forming connecting pad portions on the

interconnections, forming bump electrodes on the
connecting pad portions of the interconnections, and
forming an encapsulating film between the bump
electrodes on the upper surface of the insulating film
5 including the interconnections.

27. A method according to claim 26, further
comprising forming a solder ball on an upper surface of
each bump electrode.

28. A method according to claim 26, further
10 comprising forming, between the insulating film and
encapsulating film, an upper insulating film having
holes formed in portions corresponding to the bump
electrodes.

29. A method according to claim 26, wherein the
15 bump electrodes are formed to protrude from an upper
surface of the encapsulating film.

30. A method according to claim 29, wherein each
bump electrode has a lower bump electrode and upper
bump electrode.

20 31. A method according to claim 26, further
comprising forming, on the insulating film, connecting
lines connected to the interconnections.

32. A method according to claim 31, further
comprising forming lower bump electrodes by
25 electroplating so as to be leveled with the
encapsulating film, and forming upper bump electrodes
on the lower bum electrodes by electroplating by using

the connecting lines as plating current paths.

33. A method according to claim 23, wherein the interconnections are formed on the upper surface of the insulating film.

5 34. A method according to claim 33, wherein after the interconnections are formed on the upper surface of the insulating film, the recess is formed in the insulating film.

10 35. A method according to claim 34, wherein the recess is formed by etching by using the interconnections as masks.